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ABSTRACT

A study examined key determinants of apprentice and trainee employment in small and medium-sized enterprises that play an increasing role in providing employment-based training in Australia. It used unit record data from four waves of the Australian Bureau of Statistics business growth and performance surveys 1994-95 to 1997-98, which sent questionnaires to 13,000 businesses nationwide that employed fewer than 200 employees. Statistical analysis, using a probit regression, was undertaken to model influence of businesses' variables on their propensity to provide apprentice and trainee training. Analysis provided no evidence of one business characteristic that triggered small and medium-sized enterprises to provide training. Larger firms, firms with a high proportion of full-time staff, and firms expanding in size within the confines of their existing sites were more likely to provide training. More stable economic conditions and the ability to expand their enterprise increased the propensity to train. Analysis supported qualitative research that found managers' educational background and traditions of apprentice training within an industry had considerable impact on the decision to take on an apprentice and provided evidence of a significant effect of a training culture on employers' propensity to provide entry-level training. (Appendixes include 26 references, method used for construction of dummy variables, and detailed results for a logistic regression.) (YLB)

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NCVER Australian Apprenticeships

Factors affecting the provision of entry-level training by enterprises

K Ball

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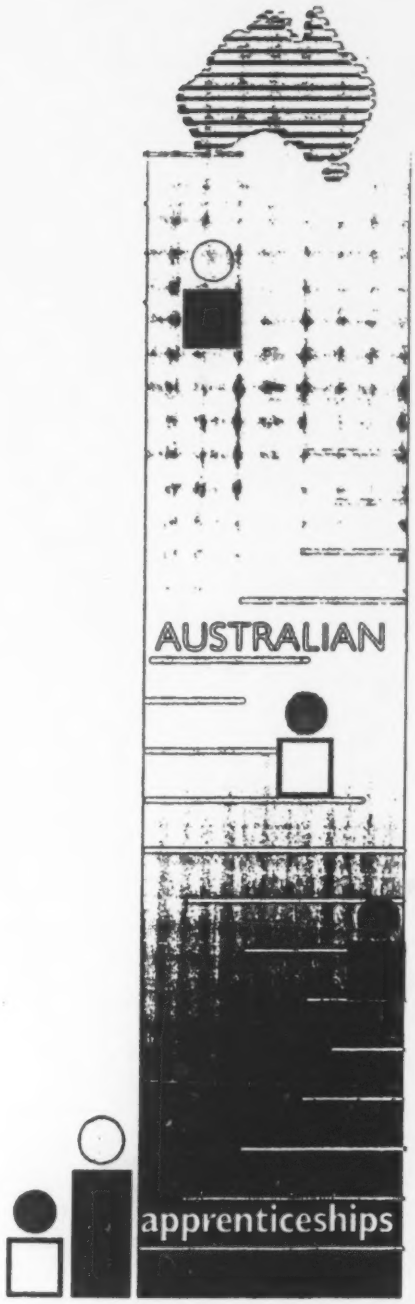

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Executive summary

This report has been prepared as part of the National Centre for Vocational Education and Research (NCVER) Research and Evaluation program. The report examines the key determinants of apprentice and trainee employment in small and medium-sized enterprises. The study was undertaken in response to evidence of the increasing role played by small and medium-sized firms in providing employment-based training in Australia.

The research presented in the report utilises unit record data from the four waves of the Australian Bureau of Statistics, business growth and performance surveys conducted over the period 1994-95 to 1997-98. The surveys involved national questionnaires sent to 13 000 businesses selected from the ABS business register. Only those businesses employing fewer than 200 employees were included in the scope of the sample. The surveys were designed to provide information on the growth and performance of Australia's employing businesses while identifying the economic and structural characteristics of these businesses.

Statistical analysis, using a probit regression was undertaken to model the influence of the business' variables on the propensity of the businesses to provide apprentice and trainee training.

The results from the regression analysis support many of the findings of training drivers presented in the literature review. It is likely that some of the variation in results between this and other studies can be attributed to the use of different data and research methods.

The analysis provides no evidence of a single business characteristic acting as a trigger for small and medium-size enterprises to provide apprentice and trainee training. However, employment characteristics do affect an enterprise's propensity to undertake apprentice and trainee training. Larger firms and firms with a high proportion of full-time staff are more likely to provide apprentice and trainee training than other firms. Firms that are expanding in size within the confines of their existing sites are also likely to provide apprentice and trainee training. The analysis provides evidence which supports claims by employers that more stable economic conditions and the ability to expand their enterprise increases the propensity to train trade apprentice and trainees.

The research supports the view that employment and training are inextricably linked. The analysis highlights the relationship between expanding employment, the skills-needs ratio and the provision of apprentice and trainee training.

The analysis provides support to qualitative research that found the educational background of managers and the traditions of apprentice training within an industry have considerable impact on the decision to take on an apprentice.

The most important result of the regression analysis is the support provided to the concept of a training culture. This analysis provides evidence of a significant effect of a training culture on employers' propensity to provide entry-level training.

There are a number of elements of a training culture in small and medium-sized enterprises that emerge from the analysis of the business longitudinal survey. The training experiences of enterprise decision-makers are a crucial factor influencing the decision to train apprentices and trainees. If the head of a firm has a trade qualification then the firm is highly likely to conduct apprentice and trainee training. Firms that undertake programs of formal structured training and on-the-job training for their employees are highly likely to utilise the apprentice and trainee system for entry-level training.

Introduction

Background

This study examines the provision of apprentice and trainee training opportunities in Australian small and medium-sized enterprises. The research utilised data from the Australian Bureau of Statistics, business growth and performance surveys conducted between 1994-95 and 1997-98.

The objective of the research is to identify the key determinants of apprentice and trainee employment in Australian small and medium-sized enterprises. The entry-level training activities of small and medium-sized enterprises are of interest because they account for a significant and growing proportion of Australia's total employment. The study was undertaken in response to evidence of the increasing role played by small and medium-sized firms in providing employment-based training in Australia.

In a study of the structure of Australian business, the Department of Employment Workplace Relations and Small Business (DEWRSB 1999) found that about 95% of all enterprises in Australia were private-sector 'small enterprises'. In an analysis of employment generation the Australian Bureau of Statistics (ABS) reported that in 1996–97 small enterprises contributed 53% of Australia's total job generation and that private small enterprise employment accounted for 42% of total Australian employment (ABS 1998). These findings were supported by the Productivity Commission which found that Australian firms with less than 20 employees accounted for 53% of new employment over the ten years prior to 1994–95 (Productivity Commission 1996).

The Productivity Commission (1996) attributed the expansion of employment in small enterprises to the contraction in the share of public employment, increases in the sectoral employment share of services and the reduction in the average size of a manufacturing firm. Although it is recognised that large enterprises are more likely to provide training than small and medium-sized enterprises, the size of the enterprise is becoming less of a predictor of training than the market position and internal composition of the enterprise.

In a related study examining the changing nature of work and its implications for vocational education and training (VET) in Australia Waterhouse, Wilson and Ewer (1999) reported:

> *The scale [size] of the enterprise . . . in which employment is found has changed . . . Self employment grew by 255 000 people between 1986 and 1993; the number of employees working for firms employing fewer than 20 people increased from 1 271 000 to 1 509 000 over the same period, while enterprises employing more than 100 people shed some 7000 jobs.*
>
> (Waterhouse, Wilson & Ewer 1999, p.8)

Waterhouse, Wilson and Ewer (1999) attribute the growing importance of small enterprises to shifts in Australia's industrial composition. Significant changes which have affected the employment composition include the downsizing and privatisation of public utilities and contractions in manufacturing employment.

Employment opportunities and conditions found in small and medium-sized enterprises differ from those in medium and large enterprises. According to the Productivity Commission (1996) part-time employment is more prevalent in large enterprises than small enterprises. Interestingly, casual employment (no access to paid sick leave) is more prevalent in small enterprises. Labour turnover tends to be higher in small enterprises; small enterprises tend to expend less on staff training and average hourly rates of pay are lower for employees of small enterprises. Braddy (1998) suggests that employment opportunities and the entry-level training efforts of an enterprise are inextricably linked. While many positions

involving entry-level training are newly created, current employees transferring into a training contract will fill other positions in the training system.

Small and medium-sized enterprises

The Organisation for Economic Cooperation and Development (OECD) noted as early as 1985 that there was a tendency towards the concentration of workers in small enterprises in several of its member states, even after having taken into account shifts in industrial structure and sectoral composition. The OECD also found that 'small firms have been particularly important in net job growth over the past 10 or 15 years' (OECD 1985, p.80).

The terms 'small enterprise' and 'small and medium-sized enterprises' have been defined in Australia in a number of ways. Depending on the institutional or historical context, the major criteria for defining the size of enterprises include legal status, ownership status, the distinction between the operation of an enterprise at a craft or industrial level, or the industry in which a firm operates. The ABS has generally used business size categories to define small and medium-sized enterprises. The scope of this analysis will be the employment size of the enterprise, not the workplace.

The ABS defines small enterprises as those which employ less than 20 people. This definition also includes enterprises regarded as micro businesses—those employing less than five people. Medium-sized enterprises are, however, considerably larger and are defined as those enterprises employing more than 20 but fewer than 200 people.

Distinctive features of Australian small and medium-sized enterprises

The ABS (1997) small business study shows that, between 1983–84 and 1995-96, average small enterprise employment growth was 3.7 per cent per annum. In 1995–96 small-enterprises:

- provided 31 per cent of total employment
- paid 32 per cent of national salaries
- accounted for 33 per cent of total sales of goods and services

Examining Australian enterprise composition, the Department of Employment, Workplace Relations and Small Business (DEWRSB 1999) shows that small enterprises display a number of distinctive characteristics.

- In 1997 males accounted for 65 per cent of decision-makers/operators of small enterprises. The 35 per cent of female decision-makers were over-represented in clerical occupations. Among the trades, occupations traditionally the stronghold of apprentice and trainee training, female representation was below 10 per cent.
- Small enterprises have a lower propensity to export goods and services than large enterprises. Only 2 per cent of micro-enterprises (1 to 4 employees) exported goods and services in 1995–96, compared with 38 per cent of enterprises employing 200 or more.
- In 1995-96 only 6 per cent of micro enterprises had employees represented by a union. The size of the enterprise is proportional to the likelihood of union representation. Enterprises with 100 or more employees had a union representation rate of 69 per cent.

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Apprentices and trainees in small and medium-sized enterprises

The potential for entry-level training has now been expanded beyond the traditional realms of the trades, and apprenticeships and traineeships are available in a wide range of occupations and industries. In 1999, there were about 100 occupations in which an apprenticeship or traineeship could be undertaken. Analysis of data from the national contracts-of-training database reveals that between 1996 and 1999 there were more than 30 additional occupations in which apprenticeships and traineeships were undertaken.

Research conducted by the Department of Employment Training and Youth Affairs (DETYA 1997), examining the labour market for apprentices found that almost all employers in Australia received an adequate supply of suitably qualified individuals seeking employment-based training. However, the research also found that the larger the size of an enterprise, the more likely it was to attract suitable applicants for apprenticeships. While only three suitable applicants were available to enterprises with below ten employees, more than eight were available to enterprises with more than 100 employees.

The recent development of Australia's market-oriented employment-based training system has favoured large enterprises since these enterprises have been better able to influence the direction and emphasis of the training system (Freeland 1999, p.53). Further, Baker and Wooden (1995) recognise that small business managers have a 'weak training capability'. Therefore, the most important question that remains is, how do enterprises, that are not large enterprises, utilise the apprenticeship and traineeship system?

A French survey conducted in 1995 found that small and medium-sized enterprises provided more employment-based training than did large enterprises (Cereq 1998). Australian data from 1996–97 supports this view but is likely to be distorted by high levels of 'unknown' employer size.

In his study of learning in small businesses Kearns (1995, cited in NCVER 1998) concluded that there was a tendency for small enterprises to see training as a cost, not an investment. This conclusion suggests that the extent of training, including employment-based training for small-enterprises could reasonably be expected to be low. However, the 1998 figure for small-enterprise apprentice and trainee commencements do not support Kearns' (1995) perception of small enterprise attitudes to training — at least as far as employment-based training is concerned.

Notwithstanding these research findings, small and medium-sized enterprises account for a high proportion of contract commencements. Between 1996–97 and 1998–99 small and medium-sized enterprises accounted for between 59% and 66% of all known commencements (see table 1).

Table 1: Commencements of contracts of training by employer size (%), 1996–97 to 1998–99

Size of enterprise (known)	1996–97	1997–98	1998–99
Small	51.0	48.6	40.7
Medium	15.6	17.5	18.6
Large	33.4	33.9	40.7
Total known %	**100.0**	**100.0**	**100.0**
Total known* (number)	**49 265**	**67 522**	**96 601**
Total (number including unknown)	**93 500**	**122 500**	**160 200**

Source: NCVER contract of training statistics, unpublished data.
Note: Approximately 45% of contract-of-training commencements by enterprise size are unknown.

Private sector employers and group training companies were responsible for the majority (93%) of Australian apprentices and trainee commencements during 1998 (NCVER 1999). There were about 103 000 private sector commencements in 1998, while commencements with group training companies were over 21 000.

Because of the increasingly important role played by small enterprises in providing entry-level employment and the expansion in the range of occupations available to apprentices and trainees, it is important to examine the key determinants of entry-level training in small and medium-sized enterprises.

Previous research

In Australia, as elsewhere, most research in the field of vocational education and training has been driven by the perceived need to reform the public provision of training and therefore has focused on the supply side of the training market. Research on the demand side has primarily concentrated on the processes of training within the enterprise and the benefits to employers from an investment in training. To date, limited research has been conducted into the drivers of apprenticeship training per se.

ABS (1997) statistics on training expenditure show that 13% of enterprises employing between one and 19 employees provide some training, compared with 51% of enterprises employing between 20 and 99 employees and 88% of enterprises with 100 or more employees. The Bureau of Industry Economics (BIE 1991) suggests that training of employees in small enterprises is low owing to the low level of managerial and training skills of small enterprise owners and managers.

Differences exist between the extent and type of training provided by enterprises with different characteristics (for example, industry, size and history). In addition, the method of training delivery also differs between enterprises. Small and medium-sized enterprises do not simply demand different levels of training by comparison with large firms, they also express and fulfil this demand in myriad ways (Smith & Hayton 1999). Smith and Hayton identified major determinants affecting the training efforts of enterprises and developed a general model representing enterprise training. Factors found to significantly affect the provision of training by enterprises included:

- competitive pressure
- work re-organisation
- new technology
- quality processes
- industrial and award restructuring
- size of the enterprise
- training infrastructure
- level of training decision-making

Industries have their own traditions of training that are expressed very clearly at the enterprise level and have considerable impact on the level of training provided. In the construction industry there is a very strong tradition of apprentice training. Smith et al (1995) point out that this tradition of support for young tradespersons was most clearly articulated by managers in the building and construction enterprises. They themselves often worked their way up to positions of management from a trade background and felt it was their duty to the industry and to society at large to further the apprenticeship system within their own enterprises.

> *…there were clear examples of relatively small enterprises supporting a surprisingly large number of apprentices in a way that would have been viewed as uneconomic in other industries. Most of the apprentices were to be found in the major contracting enterprises but many of the larger subcontracting enterprises also hired apprentices.*
>
> (Smith et al 1995, p. 103)

It has been suggested by Ridoutt (2000) that other factors, including the occupations of workers employed, sector of employment (public versus private), size of the enterprise and employment status of employees all exert an influence on the extent of training provision. Ridoutt provides examples from the ABS survey of education and training experience which show how these characteristics of enterprises have affected the provision of on-the-job training.

Long et al. (1999, table 5) have compiled a matrix of the factors which result in higher incidence of training provision. The matrix presents common findings of researchers examining the 'drivers' of training provision. Large firms, firms working in finance and business services, the public sector and economy-wide full employment (although low unemployment may also be a driver) are common characteristics related to high levels of training provision.

Blandy et al. (1999) conclude that the type of training provided by firms is directly related to the presence of internal labour markets, capital investments and competitive production conditions.

If enterprises are to undertake training of staff then it must be seen as beneficial to do so. This is especially important for small enterprises which are less willing to adopt untested practices and processes. While it is generally agreed that training does produce benefits for enterprises and individuals (Billett & Cooper 1997), few studies have agreed on the extent of benefits derived by enterprises from the provision of training. Studies of the effect of training on enterprises have tended to be based on marginal productivity of workers and their contributions to production. Research by Long et al. (1999) examined the different types of training as they related to productivity. It was revealed that the drivers of productivity increases were difficult to determine—in fact, they conclude 'it is rarely possible to isolate the effects due to particular characteristics of training'.

While it is agreed that training is beneficial to all enterprises to ensure their competitiveness and profitability, the conditions facing enterprises in the employment and organisation of staff do affect the type of training provided and the methods used for training. The employment and organisational characteristics of enterprises differ between industries, size of enterprises and regions.

While there has been considerable research undertaken which examines the influences on training provision, there has been only limited research on specific influences on entry-level training. Examining employers and group training companies, the Department for Employment Training and Youth Affairs (DETYA 1997) identified business activity, employment subsidies and the supply of suitable applicants as the key drivers in determining the extent of Australian enterprises' entry-level training efforts. Kapuscinski (forthcoming) undertook a quantification of the influences on entry-level training using unit record data from the ABS training expenditure and training practices surveys. Kapuscinski's research presents a set of factors which he believes exert profound influences on the provision of apprentice and traineeship training. The characteristics of firms found to affect the provision of entry-level training include:

- size of firm
- age of firm
- share of full-time and permanent employees
- competitiveness of firm relative to industry

In addition to the characteristics of firms, it was the training culture, measured by Kapuscinski as the average training expenditure per worker, which was also shown to have a positive influence on the provision of entry-level training.

The stage of the business cycle is a key determinant of the provision of apprenticeship training by firms. Kapuscinski (2000) reported preliminary findings of a model of entry level training using data on the total number of contracts of training for entry level trainees (ie the total stock of apprentices and trainees at a given point in time) from 1968 to 1998. The evidence from the model points to the significant impact of business cycles on the employment of apprentices and trainees. Entry-level training falls with a rising unemployment rate and is positively related to both the vacancy rate and the employment-population ratio. These results demonstrate the importance of the state of the labour market on the growth of entry level training.

While it is agreed that training is beneficial to all enterprises to ensure their competitiveness and profitability, the conditions facing enterprises in the employment and organisation of staff affects the type of training provided and the methods used for training. The employment and organisational characteristics of enterprises differ between industries, size of enterprises and regions.

Methodology

Scope

Three distinct types of people work in Australia's small and medium-sized enterprises. The three groups are employers people working in their own business with employees [ABS, 1995], own account workers and employees. Research activity relating to small and medium-sized enterprises has focussed on employers and access to and suitability of management training (Gibb 1997). The scope of this analysis is employers who provide employment-based training. Therefore, results from the analysis are directly related to employees of small and medium-sized enterprises. Table 2 presents the national distribution of enterprises by industry and size.

Table 2: Number of enterprises by industry and employer size 1998–99 (000s)

	Small Enterprises	% Enterprises Small	Large Enterprises	% Enterprises Large	Total Enterprises
Mining	2.7	96.4	0.1	3.6	2.8
Manufacturing	78.5	98.2	1.4	1.8	79.9
Construction	162.6	99.8	0.3	0.2	162.9
Wholesale trade	61.8	99.2	0.5	0.8	62.3
Retail trade	154.7	99.5	0.8	0.5	155.5
Accommodation, cafes & restaurants	35.0	98.9	0.4	1.1	35.4
Transport & storage	57.5	99.7	0.2	0.3	57.7
Finance & insurance	19.2	98.0	0.4	2.0	19.6
Property & business services	199.4	99.6	0.9	0.4	200.3
Education	20.8	98.1	0.4	1.9	21.2
Health & community services	71.4	99.2	0.6	0.8	72.0
Cultural & recreational services	62.9	99.7	0.2	0.3	63.1
Personal & other services	74.8	99.7	0.2	0.3	75.0
Total	**1001.3**	**99.4**	**6.4**	**0.6**	**1007.7**

Source: ABS (2000) Australian small business 1999, Cat no. 1321.0, Table 3.4 p.29

Small enterprises in table 2 are those enterprises employing less than 100 employees in any industry, a definition different from that used by the ABS (ABS, 1999). Therefore the data contained in this table differs slightly from data published by the ABS.

Mining, finance and insurance and education are three industries in which the percentage of enterprises classified as small enterprises is considerably below the average enterprise representation. Although a limited number of industry groups have greater numbers of large enterprises, sampling techniques used in the data collection for the Business Longitudinal Survey (BLS) enables an accurate representation of enterprises by industry to be derived.

Business Longitudinal Survey (BLS)

The Business Longitudinal Survey contains data derived from the 1994–95 through 1997–98 business growth and performance surveys conducted by the ABS. These surveys were designed to provide information on the growth and performance of Australia's employing businesses while identifying the economic and structural characteristics of these businesses.

All business units in the Australian economy were included in the scope of the study with the exception of:

- businesses not registered as employers with the Australian Taxation Office (this generally represents non-employing enterprises)
- government enterprises
- businesses classified in the following ANZSIC industry classifications:
  - agriculture, forestry and fishing
  - electricity gas and water supply
  - communication services
  - government administration and defence
  - education
  - health and community services
  - (the sub-divisions of other services and private households employing staff and the industry groups of libraries, museums and parks and gardens were outside the scope of the survey)

Only businesses employing less than 200 employees were included in the scope of the survey.

The unit represented by the data is referred to as the management unit. The management unit is the highest level accounting unit within an enterprise and in most cases coincides with the legal entity which owns the enterprise.

Reliability of data

Two types of error are possible in survey-based data: sampling error and non-sampling error.

Sampling error is a measure of the variability which occurs because a sample, rather than the entire population, responds to the survey. One measure of the likely difference between the sample and the total population responses is the standard error. Standard errors enable calculation of confidence intervals and significance levels for the estimates.

The second type of error, non-sampling error, can occur when:

- the survey is unable to obtain comprehensive data from the businesses surveyed
- errors result from reporting with inappropriate survey mechanisms, wording of questions creating misunderstanding or inability or unwillingness to provide accurate responses
- errors as is from the processing of the survey, including coding and data recording errors

An additional non-sampling error has been introduced into the BLS by the processes of 'confidentialising' the data at the ABS. For each of the financial variables included in the survey, values have been varied slightly to negate any risk of data matching with other data sets and identifying businesses. The process of changing financial values is referred to as perturbation. Perturbation used for the BLS varies or groups outlying values. Some records were dropped from the file following the perturbation because they were deemed to be 'large businesses' in terms other than employment.

Data

The analysis uses the unit record level data from the four waves of the business longitudinal survey (BLS) from 1994–95 to 1997–98 conducted by the ABS (1999). The surveys involved national questionnaires sent to a sample of approximately 13 000 businesses selected from the ABS business register. Only those businesses employing fewer than 200 employees were

included in the scope of the survey. Attrition of enterprises occurred over the survey period and enterprises did not respond to all surveys.

The analysis selected only small and medium-sized enterprises from the data (enterprises with less than 100 employees in 1997–98) and those enterprises which had responded to all surveys. Only enterprises that continued in the survey over the four waves of the survey were included because of their ability to provide trend data related to business practices and business characteristics which could then be related to training responses from the 1997–98 survey. Despite careful selection of the enterprises included in the sample, some questions included in the compilation of variables for the analysis had missing responses.

Variables were created for the firm to represent the demographic characteristics of the decision-maker of the firm, level of employment and employment trends, training practices, type of training, training providers used, business characteristics and practices, business changes and trends, business intentions and the financial performance of the enterprise.

In 1997–98, for the first time the survey included a question which asked respondents to estimate the percentage of persons during the financial year employed in the business that were trained in 'trade and apprenticeship training and traineeships'. The options available for responses were 'none', 'up to 25%', '26% to 50%', '51% to 75%' and '75% to 100%'. Responses to this question were used to create a variable to represent whether or not a firm participated in trade and apprenticeship training and traineeships. A statistically valid sample could not be drawn from the data if responses are classified according to the five response options (see table 3). To overcome this problem, responses were divided into 'yes' and 'no' responses.

Table 3: Enterprises reporting provision of apprentice and trainee training by level of training provision 1997–98

Employees undertaking apprentice and trainee training	Number of Enterprises	% Enterprises
Nil	2466	78.0
Up to 25%	601	19.0
26% to 50%	72	2.3
51% to 75%	10	0.3
76% to 100%	14	0.4
Total valid responses	3163	100.0

Source: ABS, 1999

There were 697 (22%) enterprises in the 'yes' category and 2466 (78%) enterprises in the 'no' category.

The data-collection method does not allow segregation by type of entry-level training — apprenticeship or traineeship. Therefore, the findings reported refer to total trade and apprenticeship and traineeship training.

Analysis

Statistical analysis, using a probit regression, was undertaken to model the influence of the business' variables on the propensity of the businesses to provide apprentice and trainee training. The results of the regression analysis are detailed in appendix B.

The 95% level of significance was used to evaluate the regression results. Therefore, any variable in appendix B which has a (pr > chi-square) value less than or equal to 0.05 has a statistically significant influence on the provision of apprentice and trainee training by enterprises.

An evaluation of the influence of business characteristics has been made based on the sign of the parameter and associated odds ratios. The odds ratios are presented in table 4, together

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with an indication of the significance of the variable. The table serves as a reference for the discussion in the next section. Parameter estimates and other information used in the validation of the regression are presented in appendix B.

Characteristics of enterprises that emerged as significant influences on the propensity of small and medium-sized enterprises to participate in trade and apprenticeship training and traineeships are shown in table 4.

Table 4: Significant characteristics influencing the propensity to provide entry-level training

Significant characteristic (group of variables)	Type of influence
The industry in which the enterprise operates	Not applicable
The educational background of the decision-maker	Positive
If the enterprise is considered to be a family business	Positive
Expanding levels of trade union membership	Positive
Provision of 'other' training to staff	Negative
Employers or owners providing structured training	Positive
Associations providing training	Positive
TAFE institutes providing training	Positive
Universities providing training	Negative
Provision of structured training	Positive
Provision of on-the-job training	Positive
Provision of seminars, conferences etc.	Positive
Intended increased numbers of business locations	Negative
Low level of full-time employees	Negative
Greater size of enterprise	Positive
Increasing level of employment	Positive
Skills needs ratio (ratio of new employment to total employment)	Positive

Factors affecting provision of apprentice and trainee training

The impact of both training and non-training characteristics on the propensity of a firm to provide entry-level training was examined. The significance levels and odds ratios for individual variables included in the analysis are shown in table 5.

'Non-training' enterprise characteristics

The 'non-training' enterprise characteristics that significantly influence the provision of entry-level training by a firm are:

- the industry in which the enterprise operates
- the educational background of decision-maker
- whether or not the enterprise is considered to be a family business
- expanding levels of trade union membership among employees
- the intention to increase the number of business locations
- the size of the enterprise (entry-level measure)
- increase in employment
- level of full-time employment
- increasing skills needs ratio (measured by the ratio of new employees to total employment)

Industry

The industry in which an enterprise operates has a significant influence on the provision of apprentice and trainee training. When compared to manufacturing, enterprises from industries that were significantly less likely to provide apprentice and trainee training include wholesale trade (70% less likely), finance and insurance (96% less likely) and property and business services (80% less likely). Notably, enterprises in finance and insurance were the least likely, relative to manufacturing, to provide apprentice and trainee training. The provision of apprentice and trainee training for manufacturing enterprises was not significantly different from provision by enterprises in the industries of mining, retail trade, accommodation cafes and restaurants, transport and storage, cultural and recreational services or personal and other services.

Table 5: Significance levels and odds-ratios for variables

VARIABLE DESCRIPTION	ODDS RATIO
Non-training characteristics	
Industry	
Mining	0.72
Construction	1.41
Wholesale trade	0.29*
Retail trade	1.11
Accommodation cafes & restaurants	1.34
Transport & storage	0.62
Finance & insurance	0.04*
Property & business services	0.20*
Cultural & recreational services	0.34
Personal & other services	1.17
Open more locations	0.73
Unincorporated business	1.29
Age of business	
Less than 8-years old	1.01
16 to 20-years old	0.75
20 or more years old	0.81
Female decision-maker	0.80
Highest level of education of decision-maker	
School	1.20
Trade qualification	1.89*
Considered to be a family business	1.32*
Percentage of union membership amongst workers	
Up to 10% union membership	0.79
11 to 25% union membership	1.10
26 to 100% union membership	1.03
Expanding union membership among workers	1.71*
Major change in business structure	0.93
Increasing real wage bill	0.94
Major change in range of products or services	0.97
Major change in advertising	1.04
Major change in distribution	0.95
Major change in export markets targeted	0.92
Contracting-out	1.15
Major change in production/service technology	0.89
Intend to significantly increase production levels	1.17
Intend to open new locations	0.71*
Intend to maintain or commence exporting	0.87
Intend to introduce new goods or services	0.84
Had quality assurance processes in 1996-97	0.91
Business plan	0.87
Undertake e-commerce activities of sales or purchase	1.08
Increasing value of research and development expenditure relative to total expenditure	0.79
Compare business practices with other businesses	1.08
Use e-mail	0.80
Have a web homepage	1.07
Increased level of male employment	0.80

VARIABLE DESCRIPTION	ODDS RATIO
Percentage of employees employed full-time	
1 to 20% of employees	0.24*
21 to 40% of employees	0.74
41 to 60% of employees	0.92
Number of employees	
6 to 10 employees	1.35
11 to 15 employees	1.59
16 to 20 employees	1.58
21 to 40 employees	2.67*
41 to 60 employees	2.59*
61 to 80 employees	3.16*
81 to 99 employees	4.14*
Expanding employment	1.36*
Expanding part-time employment	0.89
Exporting business	0.91
Increasing real value of sales	0.94
Profit 1994-95	0.84
Profit 1995-96	0.88
Profit 1996-97	0.84
Profit 1997-98	1.10
Increasing debt to equity ratio	0.98
Increased profit 1994-95 to 1997-98	0.90
Training characteristics	
Percentage of workers participated in job rotation, exchange etc.	
Up to 25% of staff	0.93
26 to 50% of staff	1.13
51 to 75% of staff	0.87
76 to 100% of staff	1.13
Percentage of staff participated in on-the-job training	
Up to 25% of staff	6.09*
26 to 50% of staff	5.93*
51 to 75% of staff	5.19*
76 to 100% of staff	3.87*
Percentage of staff participated in seminars, workshops etc.	
Up to 25% of staff	1.09
26 to 50% of staff	1.02
51 to 75% of staff	1.61
76 to 100% of staff	3.42*
Percentage of staff participated in structured training	
Up to 25% of staff	2.86*
26 to 50% of staff	3.26*
51 to 75% of staff	3.98*
76 to 100% of staff	2.54*
Employers or owners of business providing job training	1.10
Employers or owners of business providing structured training	1.40*
Training provider	
Associations providing training	1.39*
TAFE providing training	11.01*
Private training providers providing training	0.89
Universities providing training	0.60*
Increased level of training provided in 1997-98	1.51
Percentage of staff received management training	
Up to 25% of staff	1.06
26 to 50% of staff	1.25
51 to 75% of staff	1.03
76 to 100% of staff	0.44

VARIABLE DESCRIPTION	ODDS RATIO
Percentage of staff received professional training	
Up to 25% of staff	0.90
26 to 50% of staff	0.78
51 to 75% of staff	1.14
76 to 100% of staff	1.34
Percentage of staff received health and safety training	
Up to 25% of staff	0.98
26 to 50% of staff	0.79
51 to 75% of staff	0.72
76 to 100% of staff	1.01
Percentage of staff received 'other' training	
Up to 25% of staff	0.82
26 to 50% of staff	0.69
51 to 75% of staff	0.41*
76 to 100% of staff	0.18*

* indicates variable significant at 95% confidence level

Characteristics of decision-maker

The characteristics of enterprise decision-makers examined were gender, highest education level attained and whether or not they were operators of a family business.

The gender of the decision-maker of the enterprise does not have a significant influence on the provision of apprentice and trainee training. However, the educational achievements of the decision-maker significantly influence the propensity of enterprises to provide apprentice and trainee training. When compared to enterprises whose decision-makers listed university as their highest educational achievement, enterprises with decision-makers who reported a trade as their highest education were significantly more likely to provide apprentice and trainee training. Enterprises with trade-educated decision-makers were more than 80% more likely than enterprises with university-educated decision-makers to provide such training. There was no significant difference between the provision of apprentice and trainee training by businesses with university or school-educated decision-makers.

Employment

The size of the enterprise significantly influences the propensity of the enterprise to provide apprentice and trainee training. When compared to enterprises employing between one and five employees, enterprises with more than 20 employees are significantly more likely to provide apprentice and trainee training. Interestingly, there is no significant difference in the level of training provision among small businesses. The likelihood of firms providing apprentice and trainee training increases in proportion to the size of the enterprise.

Enterprises with a high percentage of their workforce employed full-time are more likely to provide trade and apprenticeship and traineeship training than other firms. Enterprises with less than 21% of their employees employed full-time are significantly less likely to train trade apprentice and trainees than enterprises which have between 61% and 100% of their employees employed full-time.

Employment trends

Enterprises that expanded total employment between 1994–95 and 1997–98 were significantly more likely to provide apprentice and trainee training than enterprises with stable or declining employment levels. Although the proportion of the workforce employed full-time influences the propensity of an enterprise to train trade apprentice and trainees, analysis of employment data found enterprises with increasing rates of part-time employment are no less likely than other enterprises to train trade apprentices and trainees.

The level of union membership among workers of an enterprise is not a significant influence on the provision of apprentice and trainee training. However, enterprises with workforces

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which expanded their union membership between 1994–95 and 1997–98 were more likely to provide apprentice and trainee training than those enterprises whose workforces experienced declining or stable levels of union membership.

Enterprises with increasingly male-dominated workforces are no more likely to provide apprentice and trainee training than other enterprises.

A skills-needs ratio was derived to identify enterprises with an increasing proportion of new employees to total employees between 1996–97 and 1997–98. The skills-needs ratio measures new employment as a proportion of total employment. An increasing skills-needs ratio significantly increases the propensity of enterprises to provide apprentice and trainee training. Enterprises with increasing skills needs ratios were 50% more likely to provide apprentice and trainee training than other enterprises.

Business characteristics

The legal classification of the organisation, incorporated or unincorporated, and the age of the business do not have a significant influence on the provision of apprentice and trainee training. However, enterprises that are considered to be a family business are more likely to provide trade apprentice and trainee training than other enterprises.

Business changes

Expansion of business locations does not influence the likelihood of an enterprise providing trade apprentice or traineeship training. Major changes to the business practices and operations were examined in the analysis. Changes examined included major changes to the range of goods and services produced, the advertising, export marketing, the distribution of goods and services, production technology and major changes to the business structure. None of these major business changes were found to impact on the propensity of enterprises to provide apprentice and trainee training.

Business intentions

The BLS contains data representing the business intentions of enterprises for the proceeding three years. Business intentions examined by the BLS relate to changes in the number of locations, levels of production, exports and the introduction of new products or services. Only the intention to open new locations in the preceding three years was a significant influence on the provision of apprentice and trainee training. Enterprises intending to open new locations were significantly less likely to provide apprentice and trainee training than enterprises that did not have expansionary intentions. This result is not surprising as enterprises opening new branches would require staff to be self-sufficient and fully trained if they are operating remote sites.

Business practices

The business practices of firms were examined to determine any influence on the provision of apprentice and trainee training and included quality assurance, business planning and comparison, e-commerce activities, use of computers, exporting and contracting-out. Enterprises that export goods or services are significantly less likely to provide apprentice and trainee training than enterprises that do not export.

None of the other business practices examined in the analysis was shown to significantly affect the propensity of the enterprise to provide apprentice and trainee training.

Finances

The profitability of enterprises was measured for four continuous financial years beginning 1994–95. There is no significant difference in the likelihood of profitable enterprises providing apprentice and trainee training than enterprises that did not provide a profit.

Other business characteristics are represented by differences in characteristics over the four waves of the longitudinal survey. Characteristics examined included increasing sales revenue, increasing profit, increasing wage bill, increasing percentage of spending on research and development and increasing debt-to-equity ratio. None of the financial characteristics was found to have a significant impact on the propensity of an enterprise to provide apprentice and trainee training.

This finding implies that innovative enterprises (those increasing spending on research and development) are no more likely than other enterprises to provide apprentice and trainee training.

'Training' enterprise characteristics

A number of training-based characteristics were found to significantly influence the provision of entry-level training. The training practices, type of training and providers of training were all found to influence the propensity to provide entry-level training.

Training practices

Enterprises which increased their overall levels of staff training were no more likely to provide apprentice and trainee training than enterprises which maintained or reduced their overall level of staff training.

The approach to training delivery was examined in relation to the propensity of enterprises to provide apprentice and trainee training. Two formal methods of training delivery, structured and on-the-job, were found to significantly influence the propensity of enterprises to provide apprentice and trainee training. The higher the percentage of employees receiving structured training (up to 75%) the higher the likelihood that the enterprise would provide apprentice and trainee training.

Enterprises that provide staff with on-the-job training are significantly more likely to provide apprentice and trainee training than other enterprises. Interestingly, there was little difference in the likelihood of firms that provide more than 76% of their staff with structured training also providing apprentice and trainee training compared to enterprises that providing between 26% and 50% of staff with structured training. It would appear that firms that provide more than a quarter of their staff with on-the-job training are significantly more likely to train apprentices and trainees than other firms.

Firms that use the informal training method of job-rotation and job-exchanges are not likely to provide apprentice and trainee training. Enterprises providing 76% or more of staff through seminars, workshops or conferences training had a greater propensity to provide apprentice and trainee training than other enterprises.

Type of training

The types of training examined in the analysis were management training, professional training, health and safety training and 'other' training. In general, the type of training provided does not influence the propensity of enterprises to provide apprentice and trainee training. However, enterprises providing between 76% and 100% of their staff with 'other' training have a significantly lower propensity to provide apprentice and trainee training than do firms which provide no 'other' training.

Providers of training

A number of types of training providers were included in the analysis to determine whether there were any differences in the propensity of firms to provide apprentice and trainee training according to the type of training providers used. Classifications of training providers used in the analysis were:

- employers or owners of enterprises providing on-the-job training
- employers or owners of enterprises providing structured training
- associations providing training
- Technical and Further Education (TAFE) providing training
- private training providers providing training
- universities providing training

There was no difference in the propensity to train trade apprentices and trainees for enterprises which provided on-the-job, structured training or used private training providers compared with enterprises which did not use these providers.

Enterprises that utilised either associations (professional and industry) or TAFE for training were significantly more likely to provide apprentice and trainee training than other enterprises. Enterprises using TAFE as a training provider were more than ten times more likely to provide apprentice and trainee training than enterprises that did not use TAFE to provide any training. The use of associations for the provision of training increased the odds of also providing apprentice and trainee training by more than 1.3 times.

Emphasising the educational divide, and supporting theories relating to training culture, enterprises using a university to provide training were significantly less likely to train trade apprentice and trainees than other enterprises.

Conclusions

The results from the regression analysis support many of the findings of training drivers presented in the literature review. It is likely that some of the variation in results between this and other studies can be attributed to the use of different data and research methods.

The analysis provides no evidence of a single business characteristic acting as a trigger for small and medium-size enterprises to provide apprentice and trainee training. However, employment characteristics do affect an enterprise's propensity to undertake apprentice and trainee training. Larger firms and firms with a high proportion of full-time staff are more likely to provide apprentice and trainee training than other firms. Firms that are expanding in size within the confines of their existing sites are also likely to provide apprentice and trainee training. The analysis provides evidence which supports claims by employers that more stable economic conditions and the ability to expand their enterprise increases the propensity to train trade apprentice and trainees.

Factors that were found to positively influence an enterprise to provide apprentice and trainee training include:

- the educational background of the decision-maker
- family ownership
- expanding levels of trade union membership amongst employees
- the provision of structured training by the firm
- the provision of on-the-job training by the firm
- associations are used as training providers
- TAFE Institutes are used as training providers
- staff attend seminars and conferences
- increasing level of employment
- increasing skill needs

Claims by Braddy (1998) that employment and training are inextricably linked are supported by the relationship highlighted in this analysis between expanding employment, the skills-needs ratio and the provision of apprentice and trainee training.

The analysis provides support to the qualitative research conducted by Smith et al (1995) where the educational background of managers and the traditions of apprentice training within an industry were found to have considerable impact on the decision to take on an apprentice.

Factors that were found to negatively influence an enterprise to provide apprentice and trainee training include:

- an increase in the number of business locations
- a low proportion of full-time employees
- universities are used as training providers

The most important result of the regression analysis is the support provided to the concept of a training culture. Different studies have defined a training culture in different ways—such as, Kapuscinski's [forthcoming] expenditure measure and business planning, and the decision-maker's commitment to training (Smith & Hayton 1999). This analysis provides evidence of a significant effect of a training culture on employers' propensity to provide entry-level training.

There are a number of elements of a training culture in small and medium-sized enterprises that emerge from the analysis of the BLS. The training experiences of enterprise decision-makers are a crucial factor influencing the decision to train apprentices and trainees. If the head of a firm has a trade qualification then the firm is highly likely to conduct apprentice and trainee training. Firms that undertake programs of formal structured training and on-the-job training for their employees are highly likely to utilise the apprentice and trainee system for entry-level training.

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Appendix A

Dummy variables were created for industry, business characteristics, attributes of decision makers, employment characteristics, type of training, provision of training, training practices, changes to business, business intentions, business practices, employment changes, finances and trends. The method used for the construction of these variables, and the percentage of the sample each variable represents, are provided in the table A-1. Detailed results for a logistic regression are provided in appendix B.

Table A-1: Apprentice and trainee training: construction of variables, BLS

Explanatory Variable	Abbreviation (for variable names in table B1)	Per cent (n= 3836)	Definition
Industry (reference group: manufacturing)			
Mining	indust1	0.8	if industry=100 then indust1=1; else indust1=0
Manufacturing	indust2	37	if 200<=industry<300 then indust2=1; else indust2=0
Construction	indust3	5.9	if 300<=industry<400 then indust3=1; else indust3=0
Wholesale trade	indust4	15.3	if 400<=industry<500 then indust4=1; else indust4=0
Retail trade	indust5	10.2	if 500<=industry<600 then indust5=1; else indust5=0
Accommodation cafes & restaurants	indust6	3.9	if 600<=industry<700 then indust6=1; else indust6=0
Transport & storage	indust7	3.8	if 700<=industry<800 then indust7=1; else indust7=0
Finance & insurance	indust8	3.8	if 800<=industry<900 then indust8=1; else indust8=0
Property & business services	indust9	14.8	if 900<=industry<1000 then indust9=1; else indust9=0
Cultural & recreational services	indust10	2.3	if 1000<=industry<1100 then indust10=1; else indust10=0
Personal & other services	indust11	2.2	if 1100<=industry<1200 then indust11=1; else indust11=0
Business characteristics (reference group: incorporated, less than 8–years old)			
Incorporated	orgtype1	67.5	if tolo=1 then orgtype1=1; else orgtype1=0
Unincorporated	orgtype2	32.5	if tolo=2 then orgtype2=1; else orgtype2=0
Less than 8–years old	busage1	24.2	if age8a<=4 then busage1=1; else busage1=0
8 to 16–years old	busage2	34.6	if 5<=age8a<=8 then busage2=1; else busage2=0
16 to 20–years old	busage3	13.7	if 9<=age8a<=10 then busage3=1; else busage3=0
20–or–more–years old	busage4	27.6	if 11<=age8a the busage4=1; else busage4=0
Characteristics of decision-maker (reference group, as applicable: male, university education, considered a non-family business)			
Female decision–maker	dmgend1	3.4	if sex=F then dmgend1=1; else dmgend1=0
male decision–maker	dmgend2	58.3	if sex=M then dmgend2=1; else

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Explanatory Variable	Abbreviation (for variable names in table B1)	Per cent (n= 3836)	Definition
			dmgend2=0
school highest education of decision-maker	dmedu1	21.3	if educatn=1 then dmedu1=1; else dmedu1=0
Trade highest education of decision maker	dmedu2	15.2	if educatn=2 then dmedu2=1; else dmedu2=0
Tertiary highest education of decision maker	dmedu3	24.7	if educatn=3 then dmedu3=1; else dmedu3=0
Considered to be a family business	fambus1	51.2	if fambus=1 then fambus1=1; else fambus1=0
Employment trends			
Union membership (reference group: no union membership)			
No union membership among workers	union1	80.6	if unionme8=1 then union1=1; else unoin1=0
Up to 10% union membership among workers	union2	7.7	if unionme8=2 then union2=1; else union2=0
11 to 25% union membership among workers	union3	3.8	if unionme8=3 then union3=1; else union3=0
26 to 100% union membership among workers	union4	4.1	if unionme8=4 then union4=1; else union4=0
(reference group: non increase of characteristic)			
Expanding union membership among workers	unionex1	7.3	if unionme8>unionme5 then unionex1=1; else unionex1=0
Increased level of male employment	gendemp1	27	if (totm98/totf98)>(totm96/totf96) then gendemp1=1; else gendemp1=0
Expanding employment	expemp1	40.7	if totemp98>totemp95 then expemp1=1; else expemp1=0
Expanding part-time employment	expptep1	27.5	if totpt98>totpt96 then expptep1=1; else expptep=0
Increasing skills needs ratio, new employment to total employment ratio	skratio1	27.1	If (newemp98/totemp98)>(newemp97/totemp97) then skratio1=1; else skratio1=0
Training practices			
(reference group: no increase in % of staff receiving training)			
Increased level of training provided in 1997–98	train1	15.7	if trainch8=1 then train1=1; else train1=0
(reference group: no workers participate in structured training)			
No workers participated in structured training	strain1	45	if tmstru8=1 then strain1=1; else strain1=0
Up to 25% of workers participated in structured training	strain2	25.1	if tmstru8=2 then strain2=1; else strain2=0
26 to 50% of workers participated in structured training	strain3	6.2	if tmstru8=3 then strain3=1; else strain3=0
51 to 75% of workers participated in structured training	strain4	2.8	if tmstru8=4 then strain4=1; else strain4=0
76 to 100% of workers participated in structured training	strain5	3.6	if tmstru8=5 then strain5=1; else strain5=0
(reference group: no workers participate in on-the-job training)			
No workers participated in on the job training	otjtrn1	26.5	if tmotj8=1 then otjtrn1=1; else otjtrn1=0
Up to 25% of workers participated in on the job training	otjtrn2	22	if tmotj8=2 then otjtrn2=1; else otjtrn2=0
26 to 50% of workers participated in on the job training	otjtrn3	12.4	if tmotj8=3 then otjtrn3=1; else otjtrn3=0

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Explanatory Variable	Abbreviation (for variable names in table B1)	Per cent (n= 3836)	Definition
51 to 75% of workers participated in on the job training	otjtrn4	8.3	if tmotj8=4 then otjtrn4=1; else otjtrn4=0
76 to 100% of workers participated in on the job training	otjtrn5	13.6	if tmotj8=5 then otjtrn5=1; else otjtrn5=0
(reference group: no workers participate in workshops etc.)			
No workers participated in seminars workshops etc.	semtrn1	44.2	if tmsem8=1 then smetrn1=1; else semtrn1=0
Up to 25% of workers participated in seminars workshops etc.	semtrn2	27.1	if tmsem8=2 then semtrn2=1; else semtrn2=0
26 to 50% of workers participated in seminars workshops etc.	semtrn3	6.5	if tmsem8=3 then semtrn3=1; else semtrn3=0
51 to 75% of workers participated in seminars workshops etc.	semtrn4	2.5	if tmsem8=4 then semtrn4=1; else semtrn4=0
76 to 100% of workers participated in seminars workshops etc.	semtrn5	2.4	if tmsem8=5 then semtrn5=1; else semtrn5=0
(reference group: no workers participate in job rotation, exchange etc.)			
No workers participated in job rotation, exchange etc.	jobtrn1	54.6	if tmjobr8=1 then jobtrn1=1; else jobtrn1=0
Up to 25% of workers participated in job rotation, exchange etc.	jobtrn2	18	if tmjobr8=2 then jobtrn2=1; else jobtrn2=0
26 to 50% of workers participated in job rotation, exchange etc.	jobtrn3	5.9	if tmjobr8=3 then jobtrn3=1; else jobtrn3=0
51 to 75% of workers participated in job rotation, exchange etc.	jobtrn4	2.8	if tmjobr8=4 then jobtrn4=1; else jobtrn4=0
76 to 100% of workers participated in job rotation, exchange etc.	jobtrn5	1.4	if tmjobr8=5 then jobtrn5=1; else jobtrn5=0
Type of training			
(reference group: no staff receive management training)			
No staff received management training	mantrn1	59.5	if tfman8=1 then mantrn1=1; else mantrn1=0
Up to 25% of staff received management training	mantrn2	20.1	if tfman8=2 then mantrn2=1; else mantrn2=0
26 to 50% of staff received management training	mantrn3	1.6	if tfman8=3 then mantrn3=1; else mantrn3=0
51 to 75% of staff received management training	mantrn4	0.7	if tfman8=4 then mantrn4=1; else mantrn4=0
76 to 100% of staff received management training	mantrn5	0.7	if tfman8=5 then mantrn5=1; else mantrn5=0
(reference group: no staff receive professional training)			
No staff received professional training	pftrn1	63.7	if tfprof8=1 then pftrn1=1; else pftrn1=0
Up to 25% of staff received professional training	pftrn2	15.1	if tfprof8=2 then pftrn2=1; else pftrn2=0
26 to 50% of staff received professional training	pftrn3	2.3	if tfprof8=3 then pftrn3=1; else pftrn3=0
51 to 75% of staff received professional training	pftrn4	0.6	if tfprof8=4 then pftrn4=1; else pftrn4=0
76 to 100% of staff received professional training	pftrn5	0.8	if tfprof8=5 then pftrn5=1; else pftrn5=0
(reference group: no staff receive health and safety training)			
No staff received health and safety training	hstrn1	55.8	if tfhs8=1 then hstrn1=1; else hstrn1=0
Up to 25% of staff received health and safety training	hstrn2	21.4	if tfhs8=2 then hstrn2=1; else hstrn2=0

Explanatory Variable	Abbreviation (for variable names in table B1)	Per cent (n= 3836)	Definition
26 to 50% of staff received health and safety training	hstrn3	2.6	if tfhs8=3 then hstrn3=1; else hstrn3=0
51 to 75% of staff received health and safety training	hstrn4	0.9	if tfhs8=4 then hstrn4=1; else hstrn4=0
76 to 100% of staff received health and safety training	hstrn5	1.9	if tfhs8=5 then hstrn5=1; else hstrn5=0
(reference group: no staff receive 'other' training)			
No staff received 'other' training	othtrn1	48.1	if tfoth8=1 then othtrn1=1; else othtrn1=0
Up to 25% of staff received 'other' training	othtrn2	24.2	if tfoth8=2 then othtrn2=1; else othtrn2=0
26 to 50% of staff received 'other' training	othtrn3	5.3	if tfoth8=3 then othtrn3=1; else othtrn3=0
51 to 75% of staff received 'other' training	othtrn4	2.5	if tfoth8=4 then othtrn4=1; else othtrn4=0
76 to 100% of staff received 'other' training	othtrn5	2.5	if tfoth8=5 then othtrn5=1; else othtrn5=0
Providers of training (reference group: non-provision of training by provider type)			
Employees or owners of business providing on the job training	empotj	51.8	if tpotj8=1 then empotj=1; else empotj=0
Employees or owners of business providing structured training	empstru	20.3	if tpstruc8=1 then empstru=1; else empstru=0
Associations providing training	asstrain	30.8	if tpprof8=1 or tpind8=1 then asstrain=1; else asstrain=0
TAFE providing training	tafetrn	19.3	if tptafe8=1 then tafetrn=1; else tafetrn=0
Private training providers providing training	prvtrain	14.5	if tppriv8=1 then prvtrain=1; else prvtrain=0
Universities providing training	unitrain	6.8	if tpuniv=1 then unitrain=1; else unitrain=0
Business changes (reference group: no change to characteristic)			
Open more locations	expand	15.7	if openloc5=1 or openloc6=1 or openloc7=1 or openloc8=1 then expand=1; else expand=0
Major change in range of products or services	mjcrange	53	if mjcrang5=3 or mjcrang6=3 or mjcrang7=3 or mjcrang8=3 then mjcrange=1; else mjcrange=0
Major change in advertising	mjcadvrt	41.8	if mjcadve5=3 or mjcadve6=3 or mjcadve7=3 or mjcadve8=3 then mjcadvrt=1; else mjcadvrt=0
Major change in distribution	mjcdist	30.7	if mjcdist5=3 or mjcdist6=3 or mjcdist7=3 or mjcdist8=3 then mjcdist=1; else mjcdist=0
Major change in export markets targeted	mjcxmkt	21.8	if mcexp6=3 or mjcexp7=3 or mjcexp8=3 then mjcxmkt=1; else mjcxmkt=0
Major change in production/service technology	mjcptech	40.4	if mjcprod5=3 or mjcprod6=3 or mjcprod7=3 or mjcprod8=3 then mjcptech=1; else mjcptech=0
Major change in business structure	mjcbust	12.3	if ombust6=3 or ombust7=3 or ombust8=3 then mjcbust=1; else mjcbust=0
Business intentions (reference group: no intention to change characteristic)			

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Explanatory Variable	Abbreviation (for variable names in table B1)	Per cent (n= 3836)	Definition
Intend to significantly increase production levels	intprodn	66.9	if intinc5=1 or intinc6=1 or intinc7=1 or intinc8=1 then intprodn=1; else intprodn=0
Intend to open new locations	intloc	25.9	if intoplo5=1 or intoplo6=1 or intoplo7=1 or intoplo8=1 then intloc=1; else intloc=0
Intend to maintain or commence exporting	intexpt	27.7	if intcoex5=1 or intcoex6=1 or intcoex7=1 or intcoex8=1 then intexpt=1; else intexpt=0
Intend to introduce new goods or services	intgds	57.6	if intgood5=1 or intgood6=1 or intgood7=1 or intgood8=1 then intgds=1; else intgds=0
Business practices (reference group: non existence of business practice)			
Had quality assurance processes in 1996-97	quality	42.2	if 2<=biptqm6<=4 or 2<=bipqa6<=4 then quality=1; else quality=0
Business plan	busplan	38.6	if busplan5=1 or busdoc6=1 or busdoc7=1 or busdoc8=1 then busplan=1; else busplan=0
Undertake e-commerce activities of sales or purchase	ecom	33.4	if bpele6=1 or bpele7=1 or netpay8=1 or netsend8=1 or nterpay8=1 or netrso8=1 or netmar8=1 then ecom=1; else ecom=0
Compare business practices with other businesses	compare	36.6	if bpcom6=1 or bpcom7=1 or bpcom8=1 then compare=1; else compare=0
Use e-mail	email	45.9	if netema7=1 or netema8=1 then email=1; else email=0
Had a world wide web home-page	homepage	21.4	if webhom7=1 or webhom8=1 then homepage=1; else homepage=0
Exporting business	exporter	23.7	if expgood5=1 or expserv5=1 or exgoods6=1 or expserv6=1 or exgoods7=1 or expserv7=1 or exgoods8=1 or expserv8=1 then exporter=1; else exporter=0
Contracting out	contract	12	if contout5=1 or contout7=1 then contract=1; else contract=0
Employment			
Size of enterprise (reference group: enterprises with 1 to 5 employees)			
1 to 5 employees	smemp1	31.1	if 1<=totemp98<=5 then smemp1=1; else smemp1=0
6 to 10 employees	smemp2	15.8	if 6<=totemp98<=10 then smemp2=1; else smemp2=0
11 to 15 employees	smemp3	9.2	if 11<=totemp98<=15 then smemp3=1; else smemp3=0
16 to 20 employees	smemp4	6.3	if 16<=totemp98<=20 then smemp4=1; else smemp4=0
21 to 40 employees	medemp1	17.3	if 21<=totemp98<=40 then medemp1=1; else medemp1=0
41 to 60 employees	medemp2	9.9	if 41<=totemp98<=60 then medemp2=1; else medemp2=0
61 to 80 employees	medemp3	5.5	if 61<=totemp98<=80 then medemp3=1; else medemp3=0
81 to 99 employees	medemp4	3.8	if 81<=totemp98<=100 then medemp4=1; else medemp4=0
Full time employees (reference group: 61 to 100 % full-time employees)			
1 to 20% employees full-time	ftemp1	6.3	if (totft98/totemp98)*100)<=20 then ftemp1=1; else ftemp1=0

Explanatory Variable	Abbreviation (for variable names in table B1)	Per cent (n= 3836)	Definition
21 to 40% employees full-time	ftemp2	4.7	if 21<=(totft98/totemp98)*100)<=40 then ftemp2=1; else ftemp2=0
41 to 60% employees full-time	ftemp3	6.9	if 41<=(totft98/totemp98)*100)<=60 then ftemp3=1; else ftemp3=0
61 to 100% employees full-time	ftemp4	81	if 61<=(totft98/totemp98)*100)<=100 then ftemp4=1; else ftemp4=0
Finances			
(reference group: non-profitable in the financial year)			
profit 1994–95	profit1	78.2	if derpl5>0 then profit1=1; else profit1=0
profit 1995–96	profit2	76.3	if derpl6>0 then profit2=1; else profit2=0
profit 1996–97	profit3	73.5	if derpl7>0 then profit3=1; else profit3=0
profit 1997–98	profit4	71.9	if derpl8>0 then profit4=1; else profit4=0
(reference group: non increasing characteristic)			
Increasing real value of sales	incsale1	51.6	if (sales8/104.6)>(sales5/99.0) then incsale1=1; else incsale1=0
Increased profit 1994–95 to 1997–98	incprof	46.7	if (derpl8/104.6)>(derpl5/99.0) then incprof=1; else incprof=0
Increasing real wage bill	incwage1	51.7	if (wages8/104.6)>(wages5/99.0) then incwage1=1; else incwage1=0
Increasing value of research and development expenditure relative to total expenditure	randinc1	4.6	if (inntot8/totalex8)>(inntot5/totalex5) then randinc1=1; else randinc1=0
Increasing debt to equity ratio	equity1	43.1	if (totliab8/dereq8)>(totliab5/dereq5) then equity1=1; else equity1=0

Appendix B

Table B-1: Factors influencing the propensity to provide apprentice, trade or traineeship training

The data set was composed of small and medium-sized enterprises (up to 100 employees). Dependent variable: provision of trade apprentice or traineeship training 1997–98. Data set comprises all enterprises who remained in the sample from 1994–95 to 1997–98.

Variable	D	Paramete Estimat	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardised Estimate	Odds Ratio
INTERCPT		-4.219	0.3652	133.5294	0.0001	.	.
INDUST1		-0.328	0.7676	0.1832	0.6686	-0.015959	0.72
INDUST3		0.341	0.2856	1.4313	0.2316	0.044369	1.407
INDUST4		-1.231	0.2036	36.5927	0.0001	-0.244326	0.292
INDUST5		0.105	0.2312	0.2072	0.649	0.017537	1.111
INDUST6		0.290	0.3643	0.6362	0.4251	0.030854	1.337
INDUST7		-0.481	0.3521	1.8672	0.1718	-0.050424	0.618
INDUST8		-3.254	0.8353	15.1805	0.0001	-0.344519	0.039
INDUST9		-1.636	0.2706	36.5548	0.0001	-0.32045	0.195
INDUST10		-1.088	0.5646	3.7161	0.0539	-0.090343	0.337
INDUST11		0.155	0.4148	0.1401	0.7081	0.012675	1.168
EXPAND		-0.321	0.1701	3.5712	0.0588	-0.064476	0.725
ORGTYPE2		0.256	0.1429	3.226	0.0725	0.066275	1.293
BUSAGE1		0.0096	0.169	0.0033	0.9545	0.002276	1.01
BUSAGE3		-0.286	0.1991	2.0689	0.1503	-0.054234	0.751
BUSAGE4		-0.212	0.1554	1.87	0.1715	-0.052366	0.809
DMGEND1		-0.221	0.3936	0.3164	0.5738	-0.022255	0.801
DMEDU1		0.181	0.1591	1.3001	0.2542	0.040953	1.199
DMEDU2		0.634	0.1687	14.1336	0.0002	0.125581	1.886
FAMBUS1		0.279	0.1321	4.4656	0.0346	0.076925	1.322
UNION2		-0.233	0.2067	1.2739	0.259	-0.03438	0.792
UNION3		0.098	0.2693	0.133	0.7153	0.010397	1.103
UNION4		0.03	0.2607	0.0151	0.9023	0.003487	1.033
UNIONEX1		0.536	0.2112	6.4569	0.0111	0.077104	1.71
TRAIN1		-0.019	0.1463	0.0185	0.8919	-0.003986	0.98
MANTRN2		0.055	0.1536	0.1312	0.7172	0.012301	1.057
MANTRN3		0.221	0.4051	0.2987	0.5847	0.015271	1.248
MANTRN4		0.029	0.6137	0.0023	0.9615	0.001314	1.03
MANTRN5		-0.820	0.7486	1.2023	0.2729	-0.03642	0.44
PFTRN2		-0.105	0.169	0.3905	0.532	-0.020873	0.9
PFTRN3		-0.246	0.378	0.4259	0.514	-0.020363	0.781
PFTRN4		0.134	0.7271	0.0341	0.8536	0.005588	1.144
PFTRN5		0.29	0.6805	0.183	0.6688	0.014597	1.338
HSTRN2		-0.01	0.1537	0.0108	0.9173	-0.00361	0.984
HSTRN3		-0.231	0.3212	0.5208	0.4705	-0.020268	0.793
HSTRN4		-0.325	0.4909	0.4389	0.5076	-0.01705	0.722
HSTRN5		0.0089	0.3797	0.0006	0.9811	0.000668	1.009
OTHTRN2		-0.203	0.1518	1.8037	0.1793	-0.048158	0.816
OTHTRN3		-0.369	0.2548	2.0995	0.1473	-0.045678	0.691
OTHTRN4		-0.898	0.3551	6.4005	0.0114	-0.076578	0.407
OTHTRN5		-1.743	0.4902	12.6574	0.0004	-0.149443	0.175
EMPOTJ		0.094	0.2058	0.2106	0.6463	0.026018	1.099
EMPSTRU		0.339	0.1425	5.6776	0.0172	0.075325	1.404

Variable	D	Paramete Estimat	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardised Estimate	Odds Ratio
ASSTRAIN		0.33	0.1542	4.6372	0.0313	0.084496	1.394
TAFETRN		2.398	0.1343	319.0572	0.0001	0.521872	11.008
PRVTRAIN		-0.116	0.1547	0.5641	0.4526	-0.022556	0.89
UNITRAIN		-0.507	0.2198	5.329	0.021	-0.070341	0.602
STRAIN2		1.052	0.1672	39.6166	0.0001	0.251561	2.864
STRAIN3		1.182	0.2487	22.623	0.0001	0.157657	3.264
STRAIN4		1.380	0.3469	15.8419	0.0001	0.126506	3.978
STRAIN5		0.933	0.3549	6.9256	0.0085	0.095558	2.544
OTJTRN2		1.806	0.2858	39.9372	0.0001	0.412447	6.088
OTJTRN3		1.779	0.3091	33.1511	0.0001	0.323197	5.927
OTJTRN4		1.64	0.3327	24.5062	0.0001	0.2504	5.191
OTJTRN5		1.352	0.3263	17.1724	0.0001	0.255881	3.866
SEMTRN2		0.088	0.1674	0.28	0.5967	0.021717	1.093
SEMTRN3		0.022	0.2663	0.0072	0.9322	0.003072	1.023
SEMTRN4		0.476	0.3635	1.7163	0.1902	0.041019	1.61
SEMTRN5		1.228	0.4347	7.991	0.0047	0.103126	3.418
JOBTRN2		-0.069	0.1528	0.2052	0.6506	-0.01465	0.933
JOBTRN3		0.117	0.2239	0.2752	0.5998	0.015315	1.125
JOBTRN4		-0.140	0.3081	0.2075	0.6488	-0.012856	0.869
JOBTRN5		0.12	0.4737	0.0664	0.7967	0.007782	1.13
MJCRANGE		-0.031	0.1461	0.0458	0.8306	-0.008604	0.969
MJCADVRT		0.040	0.1368	0.0859	0.7695	0.010898	1.041
MJCDIST		-0.052	0.1494	0.1242	0.7246	-0.013387	0.949
MJCXMKT		-0.085	0.1558	0.3041	0.5813	-0.019549	0.918
MJCPTECH		-0.119	0.1369	0.7662	0.3814	-0.032425	0.887
MJCBUST		-0.069	0.1769	0.1552	0.6936	-0.012635	0.933
INTPRODN		0.154	0.1615	0.9159	0.3385	0.040101	1.167
INTLOC		-0.336	0.1463	5.2999	0.0213	-0.081312	0.714
INTEXPT		-0.134	0.1756	0.586	0.444	-0.033156	0.874
INTGDS		-0.179	0.1558	1.3221	0.2502	-0.048805	0.836
QUALITY		-0.096	0.135	0.5145	0.4732	-0.026363	0.908
BUSPLAN		-0.137	0.1405	0.9626	0.3265	-0.036991	0.871
ECOM		0.076	0.1458	0.2767	0.5988	0.019953	1.08
COMPARE		0.077	0.1331	0.3382	0.5609	0.020554	1.08
EMAIL		-0.220	0.1615	1.8587	0.1728	-0.060513	0.802
HOMEPAGE		0.070	0.1672	0.1769	0.6741	0.015889	1.073
GENDEMP1		-0.223	0.1774	1.5886	0.2075	-0.05473	0.8
FTEMP1		-1.417	0.4682	9.1611	0.0025	-0.189597	0.242
FTEMP2		-0.298	0.33	0.8177	0.3659	-0.0347	0.742
FTEMP3		-0.083	0.281	0.0881	0.7667	-0.011618	0.92
SMEMP2		0.298	0.2509	1.4179	0.2338	0.06016	1.348
SMEMP3		0.462	0.2837	2.6595	0.1029	0.073831	1.588
SMEMP4		0.458	0.3038	2.2777	0.1312	0.061227	1.582
MEDEMP1		0.982	0.2555	14.7971	0.0001	0.204804	2.672
MEDEMP2		0.951	0.2877	10.9348	0.0009	0.156523	2.589
MEDEMP3		1.150	0.3283	12.2759	0.0005	0.144937	3.159
MEDEMP4		1.419	0.3494	16.5128	0.0001	0.148801	4.136
EXPEMP1		0.308	0.1371	5.0685	0.0244	0.083625	1.362
EXPPTEM1		-0.119	0.1469	0.6659	0.4145	-0.029508	0.887
EXPORTER		-0.090	0.1697	0.2859	0.5929	-0.021287	0.913
INCSALE1		-0.059	0.148	0.1621	0.6872	-0.01642	0.942

Variable	D	Paramete Estimat	Standard Error	Wald Chi-Square	Pr > Chi-Square	Standardised Estimate	Odds Ratio
PROFIT1		-0.175	0.1808	0.9386	0.3326	-0.039888	0.839
PROFIT2		-0.133	0.1694	0.6173	0.4321	-0.031226	0.875
PROFIT3		-0.176	0.1661	1.1247	0.2889	-0.04287	0.838
PROFIT4		0.093	0.1704	0.3005	0.5836	0.023142	1.098
INCPROF		-0.107	0.1452	0.5517	0.4576	-0.029681	0.898
INCWAGE1		-0.057	0.1477	0.1502	0.6984	-0.015768	0.944
CONTRACT		0.137	0.1764	0.6068	0.436	0.024589	1.147
RANDINC1		-0.234	0.2425	0.9348	0.3336	-0.027129	0.791
EQUITY1		-0.017	0.1219	0.0204	0.8863	-0.00476	0.983
SKRATIO1		0.408	0.1275	10.2749	0.0013	0.100182	1.505

Model Fit Diagnostics

Criterion	Intercept Only	Intercept and Covariates	Chi-Square for Covariates
-2 LOG L	3645.243	1918.432	1726.811 with 103 DF (p=0.0001)
Score	.	.	1699.317 with 105 DF (p=0.0001)

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